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Mapping the Bubble Trap Feeding Eruptions of Strokkur Geyser, Iceland

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Geysers are characterized by regular eruptions of hot water fountains. Their internal system consists of a heat source at depth, an often complex crack system and a conduit linking it to the surface. The conduit and crack system is filled with water, steam and gases similar to a volcano. Bubble traps are sometimes and rarely mapped and alternative heat-driven models for geyser eruptions exist.

Using a multidisciplinary, dense and close network of video cameras, seismometers, water pressure sensors and a tiltmeter we studied pool geyser Strokkur in June 2018. These multidisciplinary observations and particle-motion based tremor locations enabled us to derive a schematic cross section describing the driving mechanisms and the fluid dynamic processes within the bubble trap, crack system and conduit. We imaged a bubble trap at 23.7±4.4 m depth, 13 to 23 m west of the conduit. We divide the eruptive cycle into eruption, refilling of the conduit, gas accumulation in the bubble trap and a trail of bubbles from the bubble trap into the conduit where they collapse at depth and have gained novel insights in understanding the gas accumulation, migration and collapse in such hot geyser systems in different phases of the eruptive cycle.

The dataset of this experiment can be accessed here:

- **Eibl, E. P. S.**, Müller, D., Allahbakhshi, M., Walter, T. R., Jousset, P., Hersir, G. P., Dahm, T., (2020) 'Multidisciplinary dataset at the Strokkur Geyser, Iceland, allows to study internal processes and to image a bubble trap.' GFZ Data Services. DOI: 10.5880/GFZ.2.1.2020.007

- **Eibl, E. P. S.**; Walter, T.; Jousset, P.; Dahm, T.; Allahbakhshi, M.; Müller, D.; Hersir, G.P. (2020): 1 year seismological experiment at Strokkur in 2017/18. GFZ Data Services. Other/Seismic Network. DOI:10.14470/2Y7562610816